

REMARKS/ARGUMENTS

Applicant has carefully considered this Application in connection with the Examiner's Action, and respectfully requests reconsideration of this Application in view of the above Amendment and the following remarks.

Claims 14-19 are currently pending. Claims 1-13, 20-50, 52, and 57-60 have been withdrawn. Claims 51, 53-56, and 61 have been cancelled without prejudice.

Claim 14 is currently amended to recite a "...porous sintered ceramic being composed from one or more suitable bone substitute ceramics, such as hydroxyapatite or tricalcium phosphate...." This amendment is supported in paragraphs [0019] and [0042], and throughout the specification.

Claim 14 is currently amended to recite "...a hollow cavity extending between the two wall ceramic material layers...." This amendment is supported in paragraphs [0010] and [0023], and throughout the specification.

I. Claim Rejections

A. 35 U.S.C. § 112

Claims 14-19 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Applicants have amended Claim 14 to remove the term "a wall between two cells." The claim, as amended, recites "each wall defining cells has two wall ceramic material layers and a hollow cavity extending between the two wall ceramic material layers," and Applicants believe that this will overcome the rejection.

B. 35 U.S.C. § 102(b)/§ 103(a)

I. Claims 14-16 and 19 have been rejected under 35 U.S.C. § 102(b) as anticipated by, or alternatively, under 35 U.S.C. § 103(a) as obvious in view of, EP 254,557 to Nippondenso (“the Nippondenso Reference”). The Examiner states that the composition of EP 254,557 has approximately the form of a positive image of an open celled foam material, and that although a breaking stress of more than 1 MPa is not expressly disclosed, it is not clear that the breaking stress is outside the claimed range.

Applicants respectfully disagree. The Nippondenso Reference fails to describe each element of the current claims, as amended. Moreover, a person of skill in the art would not have been motivated to apply the a car filter of the Nippondenso Reference to the problem of providing a bone substitute material, since the bone substitute material would require different properties.

The Examiner has pointed out on p. 4 of the Office Action of 8.31.10 that the claims do not recite calcium phosphate, and therefore do not exclude the different material taught by the Nippondenso Reference. Claim 14, as amended, recites bone substitute ceramics, thereby excluding the ceramic materials of the Nippondenso Reference (page 5, lines 38 to 39 of Nippondenso).

Specifically, the Nippondenso Reference teaches ceramic structures that are not bone substitute ceramics, as shown in the following passages:

- i) Page 2, line 52 to page 3, line 10, refer to “conventional” ceramics.
- ii) The Nippondenso Reference teaches suitable ceramic materials as including “cordierite as well as alumina, mullite, beta-spodumene, silicon nitride, silicon carbide, etc” (see page 5, lines 38 to 39). These are not suitable bone substitute ceramics.
- iii) In Example 1 of the Nippondenso Reference (page 8, lines 53 to 60), the ceramic slurry is described as “mixed powder containing magnesium oxide (MgO), alumina (Al₂O₃) and silica (SiO₂) which forms cordierite on sintering” or “a mixture prepared by heating the aforesaid mixed powder to make the same into cordierite ceramic, pulverizing the cordierite ceramic to obtain synthetic cordierite powder, and stirring and mixing this powder with 5 to 10 wt% of a binder such as methyl cellulose, polyvinyl alcohol or the like, 2 to 3 wt% of a surfactant, a dispersant, etc. and 50 to

100 wt% of water.” Again, neither of these can be considered as a suitable bone substitute ceramic.

- iv) Further, in Example 5 of the Nippondenso Reference (page 10, lines 49 to 53), the ceramic slurry is “mixed powder containing magnesium oxide (MgO), alumina (Al_2O_3) and silica (SiO_2) which forms cordierite on sintering; synthetic cordierite powder prepared by heating the aforesaid mixed powder to make the same into cordierite ceramic, and pulverizing cordierite ceramic; or a mixture prepared by adding to a mixture of them a binder such as methyl cellulose, polyvinyl alcohol or the like and water”. Again, these are not bone substitute ceramics.
- v) Similarly, a ceramic that is not a bone substitute ceramic is used in Example 10 of the Nippondenso Reference (page 14, lines 7 to 12), as follows: “mixed powder containing magnesium oxide (MgO), alumina (Al_2O_3) and silica (SiO_2) which forms cordierite structure on firing, or a mixture prepared by heating the aforesaid mixed powder to make the same into cordierite ceramic, pulverizing the cordierite ceramic to obtain synthetic cordierite powder, and stirring and mixing this powder with 5 to 10 wt% of a binder such as methyl cellulose, polyvinyl alcohol or the like, 2 to 3 wt% of a surfactant, a dispersant, etc. and 50 to 100 wt% of water.” Again, these are not bone substitute ceramics.
- vi) In Example 13 of the Nippondenso Reference (page 16, line 10) cordierite ceramic is used as the ceramic. This is not a bone substitute ceramic.

None of these ceramics used can be described a bone substitute ceramic as they are not suitable for forming a bone substitute material. Moreover, they are not capable of providing the required breaking stress. The bone substitute material of the present invention has a breaking stress of more than 1 MPa, which the car filter of the Nippondenso Reference does not have since there is no need for such a high breaking stress.

The Nippondenso Reference discloses a composition with a structure having a pore size of 0.5 to 7mm long (see page 5, lines 34 to 36). This is outside the range of the pore size of the currently-claimed present invention, which is 150 to 450 μm (Claim 18), and accounts for the lower breaking stress of the composition of the Nippondenso Reference.

In addition, the currently-claimed bone substitute material has a macroporosity of 40 to 70% (Claim 17), whereas the car filter of the Nippondenso Reference has a much higher porosity of 75 to 95% (see page 5, line 37).

Therefore, the Nippondenso Reference does not teach all of the elements of the current claims, and cannot be said to anticipate the current claims. Moreover, the Nippondenso Reference teaches a composition with a different pore size, a different macroporosity, and a different material than the composition of the current claims, and there is no suggestion either in the reference or within the knowledge of a skilled artisan to suggest that this different composition would be useful in providing a bone substitute material. Therefore, the Nippondenso Reference could not have rendered the present claims obvious.

II. Claims 14-19 have under 35 U.S.C. § 103(a) as obvious in view of Zhang *et al.* (US 2005/0158535, “the Zhang Reference”) in view of EP 254,557. The Examiner states that the Zhang Reference teaches a porous sintered ceramic body having approximately the form of a positive image of an open celled foam material, and that this could be combined with the disclosure of the Nippondenso Reference to provide the composition of the current claims.

The Zhang Reference teaches a composition which lacks foam pores having length in one direction greater than length in a perpendicular direction. As described above, the Nippondenso Reference teaches a composition with a different pore size, a different macroporosity, and a different material than the composition of the current claims. Therefore, using the teachings of the Nippondenso Reference to modify the teachings of the Zhang Reference would not have resulted in the composition of the current claims, as amended.

Moreover, the Nippondenso Reference teaches a composition with elongated cells to allow the pressure loss through the filter to be reduced, while maintaining the purifying capability of the filter (see page 3, lines 4 to 6). This advantage is clearly of no relevance or significance in the field of bone substitute materials, as bone substitute materials are not required to filter or purify air or to prevent air pressure loss. Moreover, the field of bone substitute materials is clearly a specialized field with specific, medical, bio-compatibility and hygiene factors to consider, which would not be relevant to the field of an air filter.

For all of these reasons, a person of skill in the art would not have attempted to modify the composition of the Zhang Reference using the teaching of the Nippondenso Reference.

III. Claims 14-19 have been rejected under 35 U.S.C. § 103(a) as obvious in view of Twigg et al. (US 4,810,685, “the Twigg Reference”) in view of EP 254,557. The Examiner states that the Twigg Reference teaches a filter comprising a ceramic foam having approximately the form of a positive image of an open celled foam material, and that this could be combined with the disclosure of the Nippondenso Reference to provide the composition of the current claims.

Applicants respectfully disagree. The Twigg Reference teaches a catalyst foam which has a different cell structure due to the different requirements from a bone substitute material. As described above, the Nippondenso Reference teaches a composition with a different pore size, a different macroporosity, and a different material than the composition of the current claims. Therefore, modification of the compositions taught in the Twigg Reference with the teachings of the Nippondenso Reference would not have resulted in the currently claimed composition.

Moreover, one of skill in the art would not have looked to the Nippondenso Reference to modify the Twigg Reference for use as a bone substitute material. The two are from different fields with different requirements.

The current claims field of bone substitute materials is clearly a specialized field with specific, medical, bio-compatibility and hygiene factors to consider, which would not be relevant to the field of a catalyst foam as described in the Twigg Reference.

Moreover, the Nippondenso Reference teaches a composition with elongated cells allow the pressure loss through the filter to be reduced, while maintaining the purifying capability of the filter (see page 3, lines 4 to 6). This advantage is clearly of no relevance or significant in the field of bone substitute materials, as bone substitute materials are not required to filter or purify air or to prevent air pressure loss.

For all of these reasons, a person of skill in the art would not have attempted to modify the composition of the Twigg Reference using the teaching of the Nippondenso Reference.

CONCLUSION

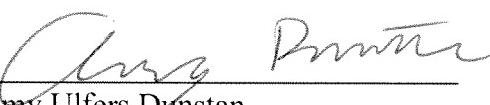
In view of the foregoing remarks and for various other reasons readily apparent, Applicant submits that all of the claims now present are allowable, and withdrawal of the rejection and a Notice of Allowance are courteously solicited.

If any impediment to the allowance of the claims remains after consideration of this amendment, a telephone interview with the Examiner is hereby requested by the undersigned at (214) 953-5990 so that such issues may be resolved as expeditiously as possible.

The Commissioner is hereby authorized to charge any fee or credit any refund to Deposit Account No. 10-0096.

Respectfully submitted,

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